

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2005/001128

International filing date (day/month/year)
04.02.2005

Priority date (day/month/year)
17.02.2004

International Patent Classification (IPC) or both national classification and IPC
F01N11/00, F01N3/08, B01D53/94, B01D53/96

Applicant
UMICORE AG & CO. KG

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-10
	No: Claims	1
Inventive step (IS)	Yes: Claims	2-10
	No: Claims	1
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V.

- 1 Reference is made to the following documents:

D1 : US 2002/026790 A1 (SHIMOTANI KEIJI ET AL) 7 March 2002 (2002-03-07)

- 2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (in the wording of claim 1) a method for determining the instant at which a nitrogen oxide storage catalyst is switched from the storage phase to the regeneration phase and for diagnosing the storage properties of this catalyst, the nitrogen oxide storage catalyst having a nitrogen oxide filling level and being arranged in the exhaust section of an internal combustion engine operated predominantly with a lean air/fuel ratio, and the filling level of the nitrogen oxide storage catalyst being determined continuously during the storage phase by integration of the nitrogen oxide mass stored per unit time at each instant (par. [0019]: computing the integrated value of NO_x), and the catalyst is switched over on the basis of the filling level which has been reached.

The subject-matter of claim 1 differs from this known method in that the filling level of the storage catalyst which remains after regeneration has been carried out is used as the starting value for determining the filling level during the next storage phase.

In D1 it is the the filling level of the storage catalyst which remains after regeneration (RSNO_x) has been carried out is used to correct the reference capacity (first reference NO_xSL) of the No_x trap to adapt the threshold at which the next regeneration will be carried out. In D1 the starting value is always zero (see fig. 2).

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

- 2.2 The problem to be solved by the present invention may be regarded as the lack of accuracy due to the extra step in the control loop and the use of a correction factor (K_{nox}) to correct the maximum filling capacity of the No trap after each regeneration.

The solution to this problem proposed in claim 1 of the present application is

considered as involving an inventive step (Article 33(3) PCT) because it simplifies the control loop and it uses the residual NO_x filling level after regeneration (RSNO_x) directly to correct the NO_xmass0 at the beginning of the next filling process without the introduction of extra correction coefficient (KNO_x) as in D1, fig.2.

3. Claims 2 to 10 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII.

1. The relevant background art disclosed in the document D1 should be mentioned in the description to fulfill the requirements of Rule 5.1(a)(ii) PCT.
2. Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, the term "wherein" used in claim 1, line 15 could be replaced by "characterised by".